CLAIMS

1. An apparatus for fabricating a three-dimensional object from a representation of the object stored in memory, the apparatus comprising:

a rotary build table for receiving successive layers of a build material; and

an array of at least one printhead disposed above the build table.

2. The apparatus of claim 1, wherein the rotary table rotates continuously.

3. The apparatus of claim 1 further comprising a build material delivery system comprising:

a storage means for holding the build material; and

a conveying means for delivering the build material to the build table.

4. The apparatus of claim 3 further comprising:

at least two storage chambers for holding at least two build material components separate from each other; and

a blender for mixing the build material components in a predetermined ratio for delivery to the build table.

5. The apparatus of claim 1 further comprising a spreader for distributing the build material over at least a portion of the build table.

6. The apparatus of claim 5, wherein the spreader comprises a counter-rotating roller.

7. The apparatus of claim 6, wherein the counter-rotating roller is skewed with respect to a radius of the rotary build table to induce excess build material to migrate over an edge of the build table.

8. The apparatus of claim 7 further comprising a sensor disposed below the edge of the build table to detect an amount of the excess build material.

9. The apparatus of claim 8, wherein an amount of build material delivered to the build table is adjusted in response to the amount of excess build material detected.

10. The apparatus of claim 1, wherein the array prints an entire surface of the build table by continuous consecutive radial scanning motions.

11. The apparatus of claim 1, wherein the array is configured to dispense fluid at substantially any radial location of the rotary build table without adjustment.

12. The apparatus of claim 11, wherein the array can be adjusted incrementally radially.

13. The apparatus of claim 1, wherein the array can be displaced from a normal printing position for servicing.

14. The apparatus of claim 13, wherein the array can be displaced radially with respect to the rotary build table.

15. The apparatus of claim 1, wherein the array includes redundant printheads.

16. The apparatus of claim 1, wherein the apparatus defines an opening for removing the three-dimensional object.

17. The apparatus of claim 16, wherein the three-dimensional object is removed through a top opening of the build table.

18. The apparatus of claim 1 further comprising a sensor to monitor at least one performance characteristic of the apparatus, wherein the characteristic is selected from the group consisting of print quality, printing errors, print speed, printhead condition, build material quantity, and table position.

19. The apparatus of claim 18, wherein operation of the apparatus is modified in response to a signal received from the sensor.

20. The apparatus of claim 19, wherein the array is movable in response to the signal from the sensor.

21. The apparatus of claim 1 further comprising a plurality of rotary build tables.

22. An apparatus for fabricating a three-dimensional object from a representation of the object stored in memory, the apparatus comprising:

a generally circular build table for receiving successive layers of a build material; and

an array of at least one printhead disposed above the build table and movable relative to the build table.

23. The apparatus of claim 22, wherein the array is movable over at least a portion of a build surface defined by the generally circular build table.

24. The apparatus of claim 22, wherein the array is configured to dispense fluid at substantially any radial location of the build table by moving the array radially to the desired location.

25. The apparatus of claim 22, wherein the array moves continuously about the build table.

26. The apparatus of claim 22, wherein the generally circular build table is movable in a vertical direction.

27. A method of fabricating a three-dimensional object comprising the steps of:

depositing successive layers of a build material on a rotary build table; and

depositing a liquid in a predetermined pattern on each successive layer of the build material to form the three-dimensional object.

28. The method of claim 27 further comprising the step of rotating the build table continuously.

29. The method of claim 27, wherein the step of depositing successive layers of a build material on a rotary build table includes distributing the build material over at least a portion of the build table with a spreader.

30. The method of claim 27 further comprising the step of measuring an amount of excess build material deposited on the rotary build table.

31. The method of claim 30 further comprising the step of adjusting the amount of build material deposited on the rotary build table based on the amount of excess build material measured.

32. The method of claim 27, wherein the step of depositing a liquid is performed by an array of at least one printhead.

33. The method of claim 32, wherein the array is configured to dispense fluid at substantially any radial location of the rotary build table without adjustment.

34 The method of claim 32, wherein the array prints an entire surface of the build table by continuous consecutive radial scanning motions.

35. The method of claim 32, wherein the array of printheads can be adjusted incrementally radially relative to the rotary build table.

36. The method of claim 32, wherein the array of printheads can be displaced from a normal printing position for servicing.

37. The method of claim 27 further comprising the step of removing the three-dimensional object.

38. A method of fabricating a three-dimensional object comprising the steps of:

depositing successive layers of a build material on a generally circular build table; and

depositing a liquid in a predetermined pattern on each successive layer of the build material to form the three-dimensional object.

39. The method of claim 38, wherein the step of depositing a liquid is performed by an array of at least one printhead.

40. The method of claim 39, wherein the array is movable over at least a portion of a build surface defined by the generally circular build table.

41. The method of claim 38, wherein the generally circular build table is movable in a vertical direction.

42. The method of claim 39, wherein the array is configured to dispense fluid at substantially any radial location of the build table by moving the array radially to the desired location.

43. An apparatus for cleaning a printhead used in a three-dimensional printer, the apparatus comprising:

a base;

a cam track disposed within the base;

a cap carrier slidably engaged with the cam track; and

a sealing cap defining a cavity and disposed on the carrier, the cap being transportable into engagement with a face of the printhead by the carrier.

44. The apparatus of claim 43 further comprising:

a cleaning fluid source in communication with the cap for cleaning the printhead face; and

a vacuum source in communication with the cap for removing used wash fluid and debris.

45. The apparatus of claim 44, wherein the vacuum source creates a negative pressure within the cavity, the negative pressure preventing the wash fluid from entering a jet nozzle and drawing at least one of a binder fluid and debris from the jet nozzle.

46. The apparatus of claim 43 further comprising a spring coupled to the carrier and the base to bias the carrier into a receiving position for receiving the printhead.

47. The apparatus of claim 46, wherein the carrier includes a stop disposed on a distal end of the carrier for engaging the printhead as the printhead enters the apparatus and the printhead slides the carrier rearward along the cam track after engaging the stop until the printhead face and cap sealably engage.

48. The apparatus of claim 47 further comprising a latch pawl coupled to the base for engaging with the carrier to prevent forward movement of the carrier.

49. The apparatus of claim 48 further comprising a squeegee disposed on a proximal end of the carrier, the squeegee positioned to engage the printhead face as the printhead exits the apparatus.

50. A method of cleaning a printhead used in a three-dimensional printer comprising the steps of:

receiving the printhead within an apparatus comprising:

a base;

a cam track disposed within the base;

a cap carrier slidably engaged with the cam track; and

a sealing cap defining a cavity and disposed on the carrier;

engaging a face of the printhead with the cap;

drawing a vacuum on the cavity; and

introducing a cleaning fluid into the cavity and into contact with the printhead face.

51. The method of claim 50 further comprising the step of removing the cleaning fluid from the cavity.

52. The method of claim 51 further comprising the steps of:

disengaging the cap from the printhead face; and

wiping the printhead face with a squeegee as the printhead is withdrawn from the apparatus.

53. The method of claim 50, wherein the vacuum source creates a negative pressure within the cavity, the negative pressure preventing the wash fluid from entering a jet nozzle and drawing at least one of a binder fluid and debris from the jet nozzle.